



Confidential

# APPROVAL SHEET

Customer Name : \_\_\_\_\_  
Customer P/N : \_\_\_\_\_  
Frequency : 32.768000 KHz  
Aker Approved P/N : D21N-032768-2-AL-00  
Aker MPN : D21N-032768-2-AL-00  
REVISION : A0  
ISSUED DATE : 2022/8/25

APPROVED	CHECKED	PREPARED
<i>Ernest</i>		<i>Kiku</i>
APPROVED BY CUSTOMER		

**AKER TECHNOLOGY CO., LTD.**

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**MSL:Level 1**

**RoHS compliant**



Aker Approved P/N : D21N-032768-2-AL-00

APPROVED : Earnest SHEET : 1 of 4

PREPARED : Kiku REV. : A0

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\*Please kindly be noted that AKER DO NOT guarantee parts quality which involves human security application.\*

## TUNING FORK CRYSTAL SPECIFICATION

### 1. ELECTRICAL CHARACTERISTICS

#### [1] Maximum Rating

	Item	Symbol	Rating	Note
1	Storage temperature range	T_stg	-55~+125°C	
2	Maximum drive level	DL max.	1.0 $\mu$ W max.	

#### [2] Recommended Operating Condition

	Item	Symbol	Rating	Note
1	Operating temperature range	T_use	-40~+85°C	
2	Drive level	DL	0.1 $\mu$ W typ.	

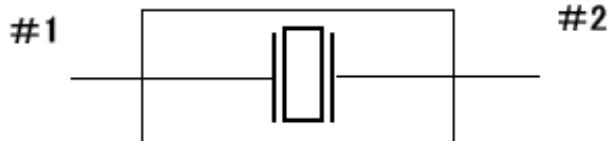
#### [3] Electrical-characteristics

Measurement temperature: 25±2°C

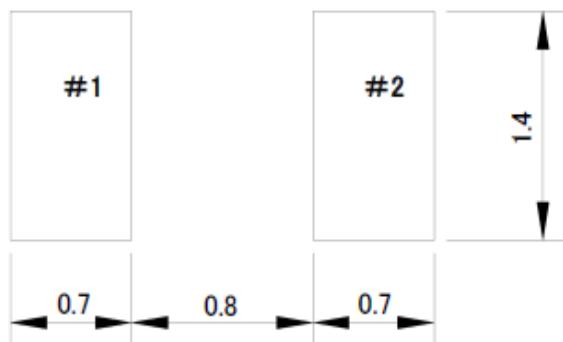
	Item	Symbol	Specification	Condition
1	Nominal frequency	f_nom	32.768 kHz	
2	Frequency tolerance	f_tol	$\pm 20 \times 10^{-6}$	
3	Load capacitance	C_L	12.5pF	
4	Motional resistance	R <sub>1</sub>	70 k $\Omega$ max.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
5	Motional capacitance	C <sub>1</sub>	6 fF typ.	
6	Shunt capacitance	C <sub>0</sub>	1.3 pF typ.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
7	Turnover temperature	T <sub>i</sub>	25 ± 5°C	Measure this coefficient at 5 points of -40°C, -20°C, 25°C, 60°C, 85°C using C-MOS circuit.
8	Parabolic coefficient	B	(-0.03±10%) × 10 <sup>-6</sup> /°C <sup>2</sup>	
9	Frequency aging	f_age	$\pm 3 \times 10^{-6}$ /year	25±3°C, First year
10	Insulation resistance	IR	500 M $\Omega$ min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V

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## 2 . INTERNAL CONNECTION:

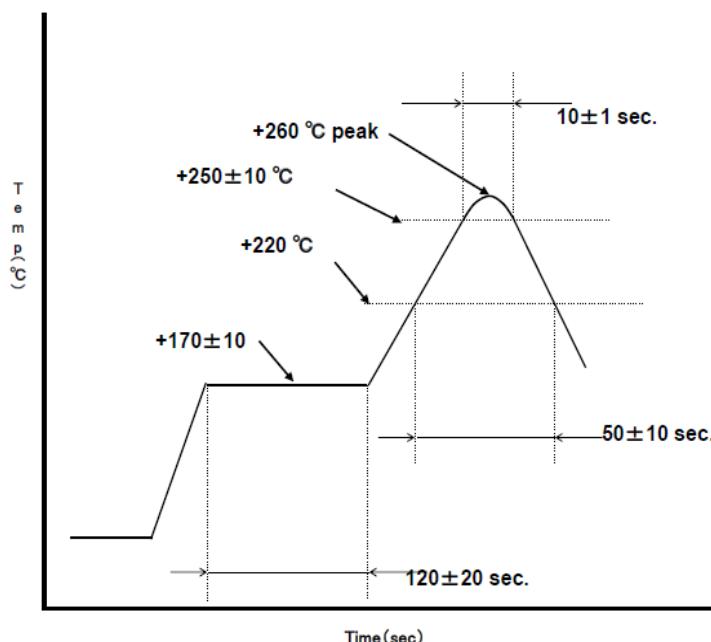


## 3 . RECOMMENDED SOLDERING PATTERN:( Unit : mm )



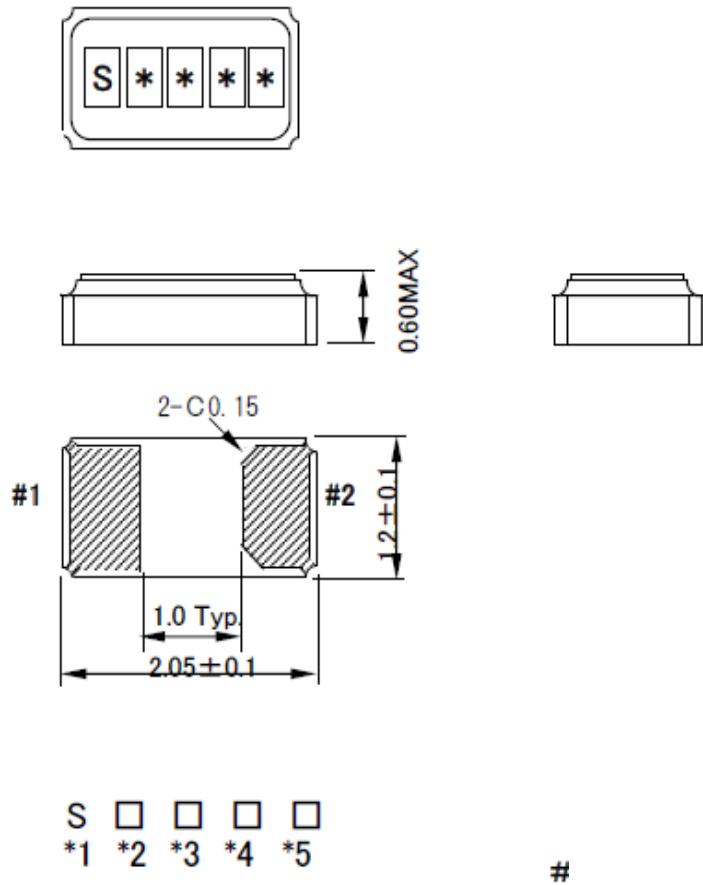
## 4. SOLDERING REFLOW PROFILE :

Pre-heating temperature : +170°C      Pre-heating time : 120sec  
 Heating temperature : +220°C      Heating time : 50sec



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## 5. DIMENSIONS : ( Unit : mm )



S       
 \*1 \*2 \*3 \*4 \*5

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- \*1 Specification
- \*2 CL (7pF: B, 9pF: J, 12.5pF: F)
- \*3 Year of Production (Last Digit of Year)
- \*4, 5 Week of Production (01 ~ 52)